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ARMY TECHNICAL INTELLIGENCE REVIEW

Nº106 Oct 1974

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Cover Picture: PK Machine Gun and AKM Assault Rifle

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FOREWORD

The BRDM scout car has now appeared in so many variants that our first article will serve a very useful purpose in clearing up any confusion that may have arisen over the years.

Two other very topical articles deal with the SA-6 SAM system and Soviet passive night vision aids.

Czechoslovakia has always been very active in the 'B' vehicle field and the article on this subject will bring you right up to date, as will the remaining two articles on the PK machine gun family and nerve agent alarms.

T. B. Palmer
Colonel Tech Int (A)

I. BRDM and its Variants

Introduction

BRDM was the first purpose built scout car produced by the Soviets and entered service in 1959. There are two versions in use, BRDM which is equivalent to our Mark I liaison Ferret and BRDM-2 which is more like the Mark 2 Ferret. In addition to the basic reconnaissance version BRDM is also used as an anti-tank guided weapons carrier and as a chemical reconnaissance vehicle. BRDM-2 is modified for both of these uses but it is also seen in a command version and more recently with a surface-to-air guided missile on it.

BRDM (Fig 1)

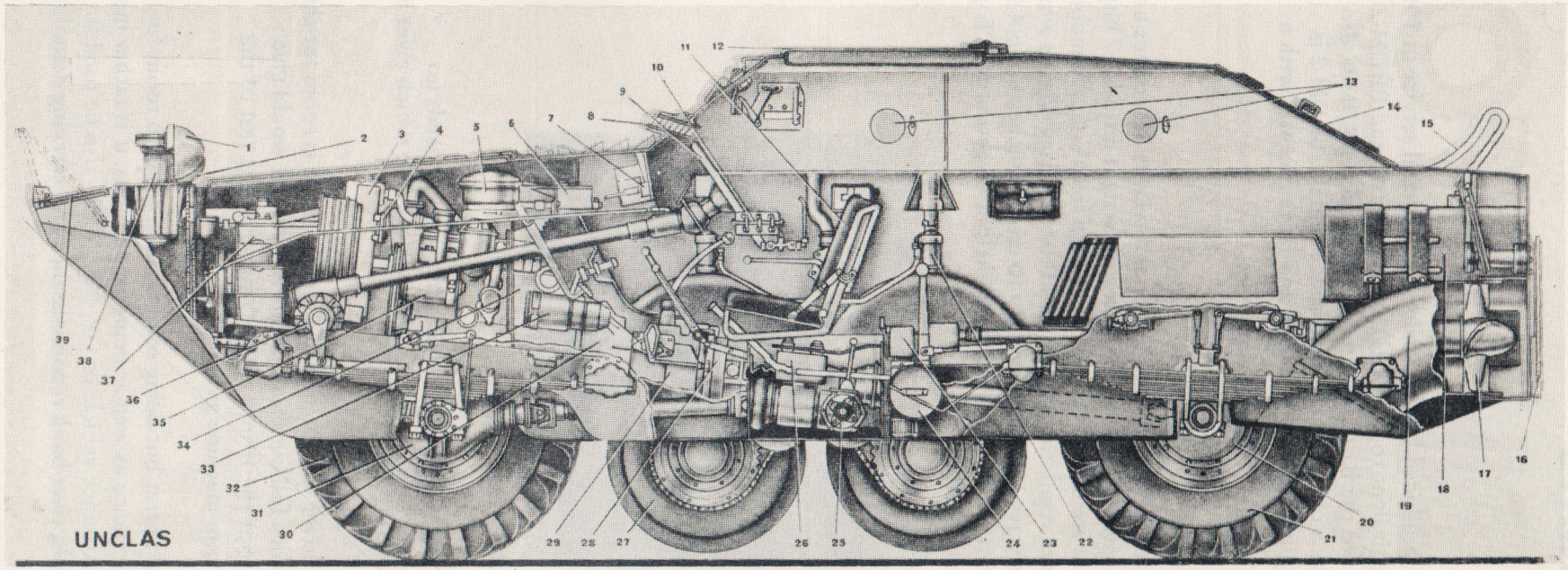
The Russian scout car is somewhat heavier and larger than the Ferret and weighs 5.1 tonnes unladen. The conventional 6-cylinder petrol engine gives 90 bhp, so the power to weight ratio is 17 bhp/tonne (Ferret 31), making it rather sluggish by our standards. In spite of this its cross country mobility is good as the vehicle has a centralised tyre pressure regulating system and four auxiliary wheels which can be lowered hydraulically when required; these give BRDM the ability to cross trenches up to 4 ft wide. In addition there is a power operated capstan at the front which will help if its gets stuck. Top speed is 50 mph and its range is some 310 miles on roads.

Fig 1. BRDM Scout Car

As would be expected from its boat-shaped hull BRDM is fully amphibious and needs no preparation before swimming. It is propelled in water by a ducted propeller at the rear which gives it a speed of 5–6 mph.

The vehicle is crewed by a commander and driver who sit side-by-side and there is room for three passengers behind them. The armour, which includes full overhead cover, is light and would give protection against ·5-in ammunition over a 60° arc at the front and 7.62 mm over the rest of the vehicle. It is armed only with a 7.62 mm or 12.7 mm machine gun.

The role of BRDM is very similar to that of Ferret but being somewhat larger with room for passengers and having a good cross country performance as well as being amphibious, it is rather more flexible. In addition to its normal use as a reconnaissance vehicle or OP, BRDM can also be used for such jobs as taking out and recovering small patrols, river bank reconnaissance and carrying demolition firing parties.



Legend

(1) Headlamp with light filter.
(2) Headlamp with blackout mask.
(3) Engine cooling system radiator.
(4) Oil radiator.
(5) Air filter.
(6) Main brake-operating cylinder.
(7) Instrument panel.
(8) Driver's observation slot.
(9) Steering wheel.
(10) Tyre inflation valve unit.
(11) Adjustable driver's seat.
(12) Double-leaf hatch lid.
(13) Observation ports
(14) Double-leaf rear door.
(15) Handrail.
(16) Hydro-jet cover.
(17) Hydro-jet propellor.
(18) Right-hand fuel tank.
(19) Hydro-jet pipe.
(20) Rear driving axle.
(21) Rear driving wheel.
(22) Auxiliary wheel hydraulic jack.
(23) Drainage system valve-holder.
(24) Shaft with drive pulley to work hydro-jet shutters.
(25) Power take-off box for auxiliary-wheel drive.
(26) Transfer box.
(27) Auxiliary wheel.
(28) Transmission brake.
(29) Gearbox.
(30) Clutch.
(31) Front driving axle.
(32) Frong driving wheel.
(33) Starter.
(34) Engine.
(35) Generator.
(36) Steering mechanism.
(37) Tyre inflation compressor.
(38) Capstan winch.
(39) Water deflecting shield.

(Fig 2. BRDM (Cutaway)

BRDM-2 (Fig 3)

This vehicle first appeared in 1966 and bears little resemblance to BRDM although it uses many of the same components. The engine is in the rear and has had its power boosted to 140 bhp so the power to weight ratio has gone up to 20, despite an increase in weight to 7 tonnes. The extra power gives BRDM-2 a slightly improved performance on land and in water; top speed is now over 60 mph and it will swim at 6–7 mph.

Armour protection is the same as in the earlier vehicle but BRDM-2 has a simple filtration and over-pressure type of NBC protection system. The armament has been greatly improved and this vehicle has a manually operated turret mounting a 14.5 mm KPVT machine gun and a co-axial 7.62 mm PKT machine gun. These guns can be used in a limited anti-aircraft role as they have up to 30° elevation. Because of the turret there is less room inside BRDM-2 which has a crew of four.

The role of BRDM-2 is the same as for BRDM, but its extra armament will make it useful for such jobs as the limited support of infantry and rear area protection against lightly armed troops such as paratroops.

Fig 3. BRDM-2

BRDM – SWATTER, BRDM – SAGGER

Both BRDM and BRDM-2 have been adapted to carry SWATTER (Fig 4) and SAGGER ATGW (Fig 5). In BRDM the launchers are in the troop compartment while in BRDM-2 they are in place of the turret, and the upper hull has been widened to make room for them. The vehicles will normally be seen with the missiles in the travelling or lowered position covered by the armoured deck. The launchers are raised hydraulically into the firing position shown in the photographs.

Fig.4 BRDM-2 SWATTER

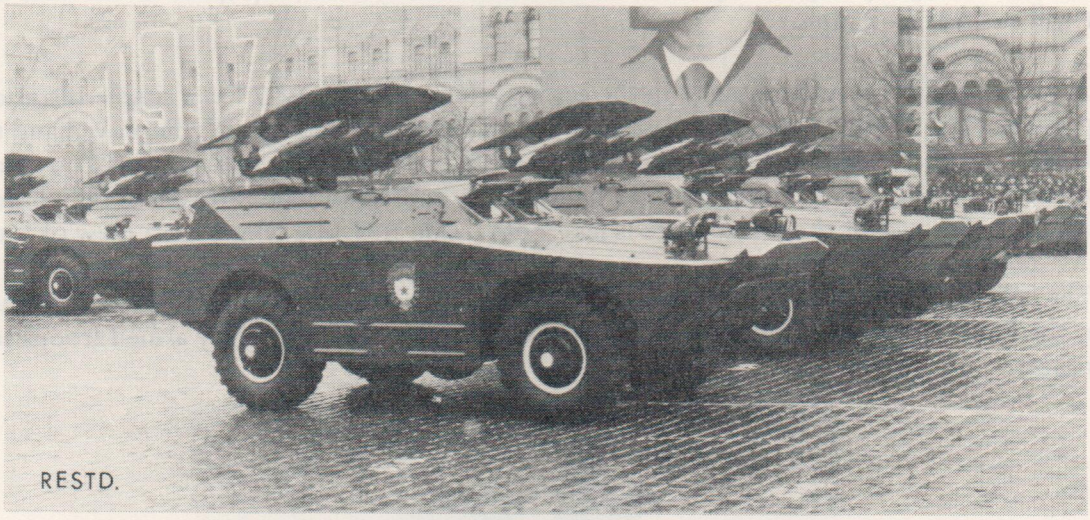


Fig 5. BRDM SAGGER

BRDM-rkh (Fig 6)

The chemical reconnaissance versions of BRDM and BRDM-2 are equipped with a GSP I or II automatic nerve agent detector and alarm; the vehicles are also fitted with an area survey meter (DP-38), a radiac meter (DP-5A) and other related equipments. They can be easily recognised by the two folding racks for marker flags one on either side at the back. These can be swung out over the rear and the flags are shot into the ground by a cartridge which is detonated electrically by pressing a button inside the vehicle. BRDM-rkh can also be used for marking minefields.

Fig 6. BRDM-2 rkh

Communications/Command Version

This is a variant of BRDM-2 which can be distinguished by having no turret and a prominent box mounted centrally on top of the vehicle (Fig 7). The box covers a generator which gives the necessary power for the extra radio equipment carried. This version is sometimes equipped with HF radio and it can be used as a step-up or as a lightly armoured command post. It is equipped with a GPK-48 vehicle navigation system which gives a digital read-out of the grid reference to the commander.

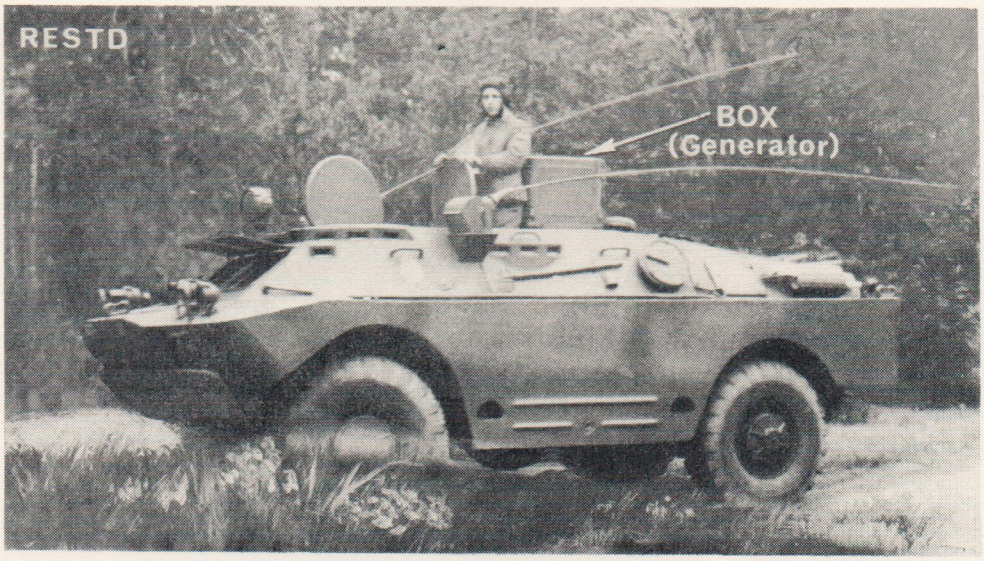
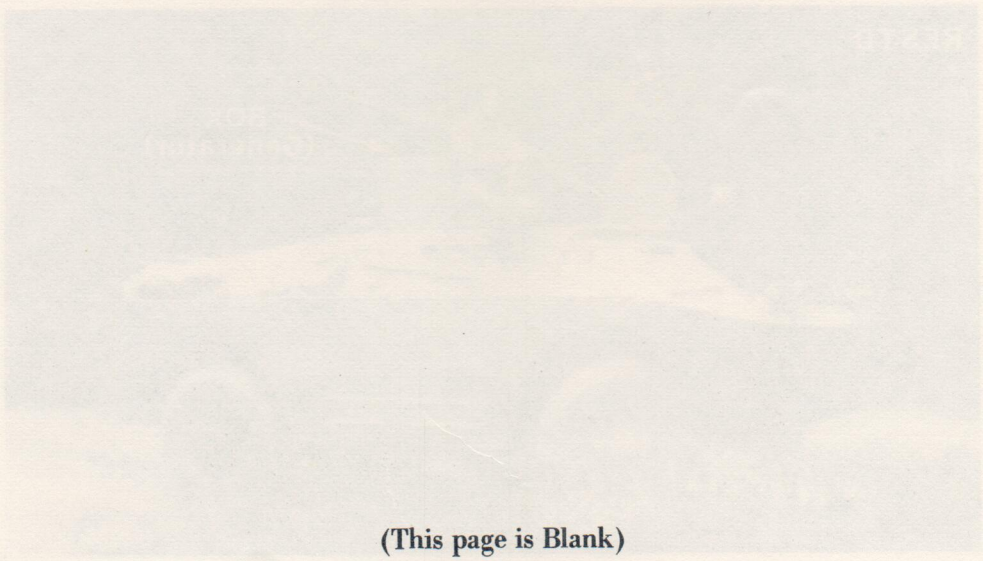


Fig 7. BRDM-2 Command Version

BRDM-2 SAM

This is the most recent variant of the BRDM family to appear. Outwardly it is a standard BRDM-2 with the turret removed and a rotating pedestal fitted in its place on which the missile mounting framework is carried. The missiles are horizontal when in the travelling position and are raised hydraulically before firing.

The main advantages of the BRDM-2 SAM are that the operator is protected and the vehicle can operate in an NBC environment. Its mobility and good communications will allow it to be quickly redeployed and easily hidden in natural features.



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2. The Soviet PK Machine Gun Family

Since we first reported on the PK family of 7.62 mm GPMGs in ATIR No 92, January 1969, the Soviets have modified and improved the basic machine gun so that it has now supplanted not only the RP-46 but also the SGM Heavy Machine Gun. The following versions of the PK machine gun now exist:

a. PK (Fig 1) The basic gun with a heavy fluted barrel, feed cover constructed from both machined and stamped components and a plain butt plate. The PK weighs about 9 kg.

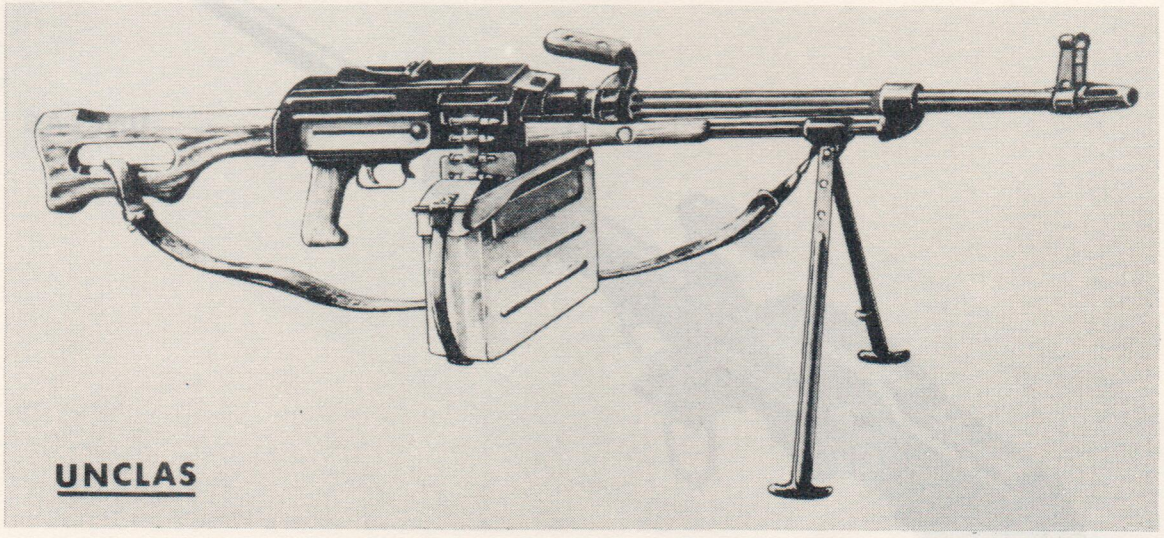

Fig 1. PK Machine Gun

b. PKS (Fig 2) The basic gun mounted on a tripod. The lightweight tripod (7.5 kg) not only provides a stable mount for long range ground fire, but also can be quickly opened up to elevate the gun for anti-aircraft fire.

Fig 2. PKS (Tripod Mounted)

c. PKT (Fig 3) The PK altered for co-axial installation in an Armoured Fighting Vehicle. The sights, stock, tripod, and trigger mechanism have been removed, a longer heavy barrel is installed, and a solenoid is fitted to the receiver back plate for remote triggering.

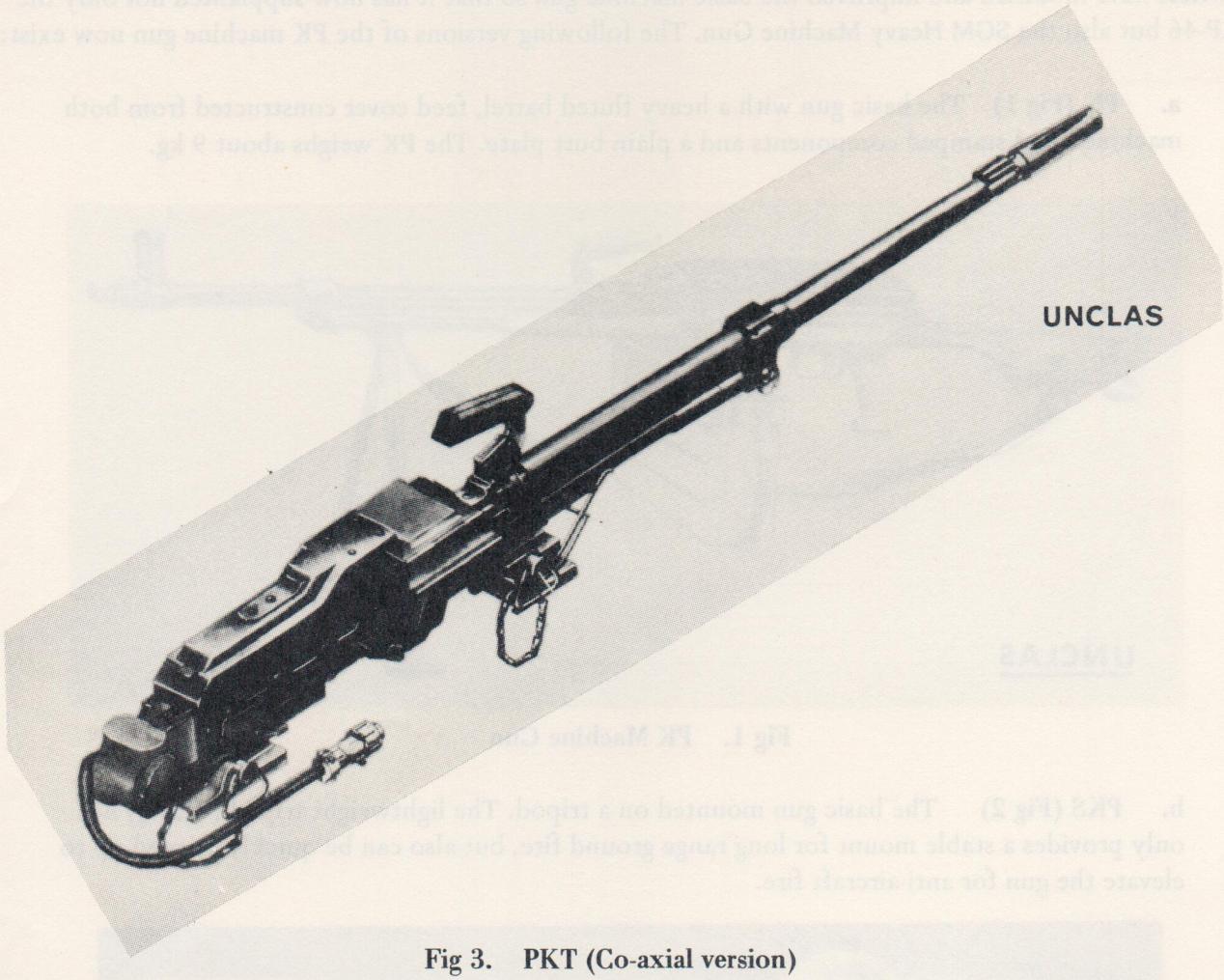

Fig 3. PKT (Co-axial version)

d. PKM (Fig 4) A product improved PK, with a lighter weight smooth barrel, the feed cover constructed wholly from stampings and a hinged butt rest fitted to the butt plate. Excess metal has been machined away wherever possibly to reduce the weight down to about 8.4 kg.

Fig 4. PKM (Improved PK)

e. **PKMS (Fig 5)** The PKM mounted on a tripod (similar to the PKS). We have reports that a new lightweight tripod exists, further details will be published when available.

Fig 5. PKMS (PKM Tripod Mounted)

f. **PKB** The PKM with the bipod, butt stock, and trigger mechanism removed and replaced by twin spade grips and a butterfly trigger, similar in those on the SGMB. This gun possibly may be known as the PKMB.

ROLE

The PK and PKM machine guns are infantry support weapons normally fired from their bipod mounts, however, both versions can be fitted in the front firing ports of the Soviet Infantry Combat Vehicle, the BMP. The PKS and PKMS also are infantry weapons and are used in the classic role of a heavy machine gun to provide long range fire, cover final protective lines, and in addition, provide anti-aircraft fire.

The PKT is used in co-axial installations on most modern Soviet tanks, armoured personnel carriers, and combat vehicles.

The PKB (PKMB) is probably used as a pintle mounted gun on older APCs such as the BRDM, BTR-50 and BTR-60 similar to the manner in which the older SGMB was utilised.

CHARACTERISTICS

The PK family of machine guns are gas-operated, rotary bolt locked, open bolt fired, fully automatic, belt fed machine guns. The 7.62 x 54 mm rimmed round is fired and this is available in plain ball, steel-cored ball, tracer, armour piercing, armour piercing-incendiary and incendiary-ranging types. The ammunition is fed by non-disintegrating metallic belts, current belts are composed of joined

25-round sections, however, earlier belts were made as one section holding 250 rounds. The belts are held either in 250-round ammunition boxes, in special large capacity boxes on tanks or in a 50-round assault magazine attached to the bottom of the gun's receiver.

The PK, PKM, and PKB guns are effective against area targets at ranges to 1000 m. They have a cyclic rate of 650 rounds per minute. When set up on their tripods for anti-aircraft fire and tracer control is used, these guns have an effective range of about 600 m.

The Soviet Union has, in the PK family of machine guns, a good, modern, general purpose weapon that utilises the best of modern machine gun design and manufacturing technology.

3. The SA-6 SAM System

The SA-6 System, a mobile field army SAM system first seen in the November 1967 Moscow parade, was used operationally and with considerable success by the Arabs in the Middle East War.

The major equipments (Fig 1) of the SA-6 system are the GAINFUL missile, triple mounted on its tracked transporter, erector, launcher (TEL) and the tracked acquisition fire control radar STRAIGHT FLUSH. An SA-6 battery normally consists of four TELs and one STRAIGHT FLUSH. In addition, the LONG TRACK early warning radar and the THIN SKIN height finder radar are associated with the system.

Fig 1. SA-6 System

The GAINFUL Missile

The missile (Fig 2) which is about 6 metres long and 300 mm in diameter, has a narrow cylindrical body with a low drag ogival nose. Aerodynamic control of the missile is by four moving wings and four fixed tail fins each of which is fitted with a moving control surface. The propulsion system employed by GAINFUL is a two stage integral boost ramjet.

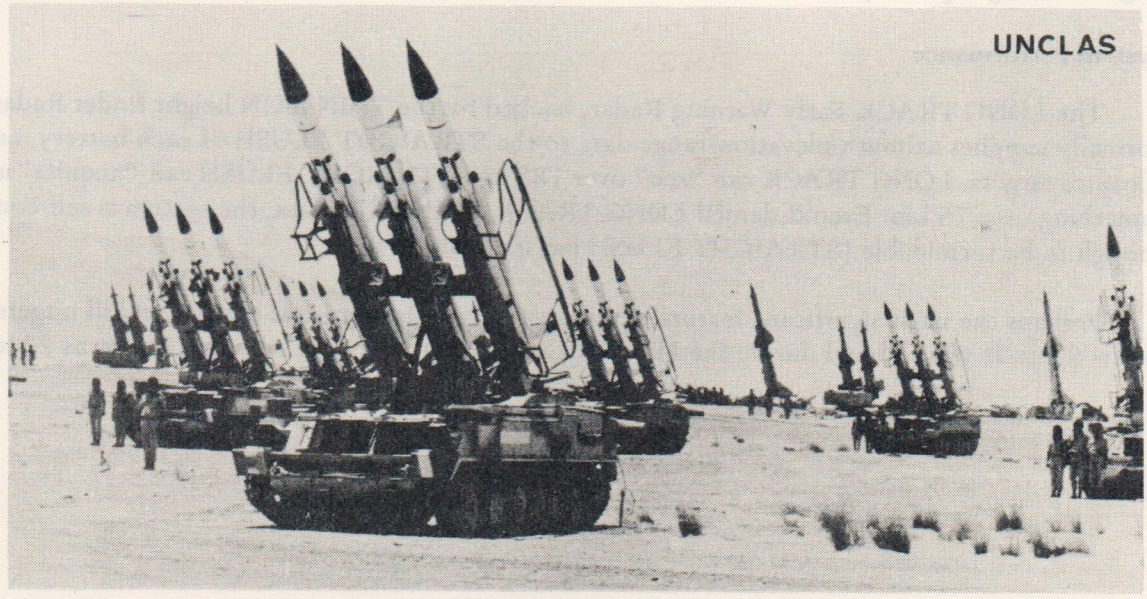

Fig 2. SA-6 TEL with GAINFUL Missiles

The SA-6 TEL

The SA-6 TEL (Fig 2) is based on the chassis of the PT-76 tank. It is about 6·5 metres long, 3 metres wide and weighs about 14,000 kg. Its road speed is probably in the region of 45 kph.

Unlike any other Soviet tracked TEL, the missiles are mounted facing rearwards. The launcher can traverse 360° and elevate the missiles to about 70°. Tree guards are fitted to protect the missiles in transit and may also be used to support canvas covers and as servicing platforms.

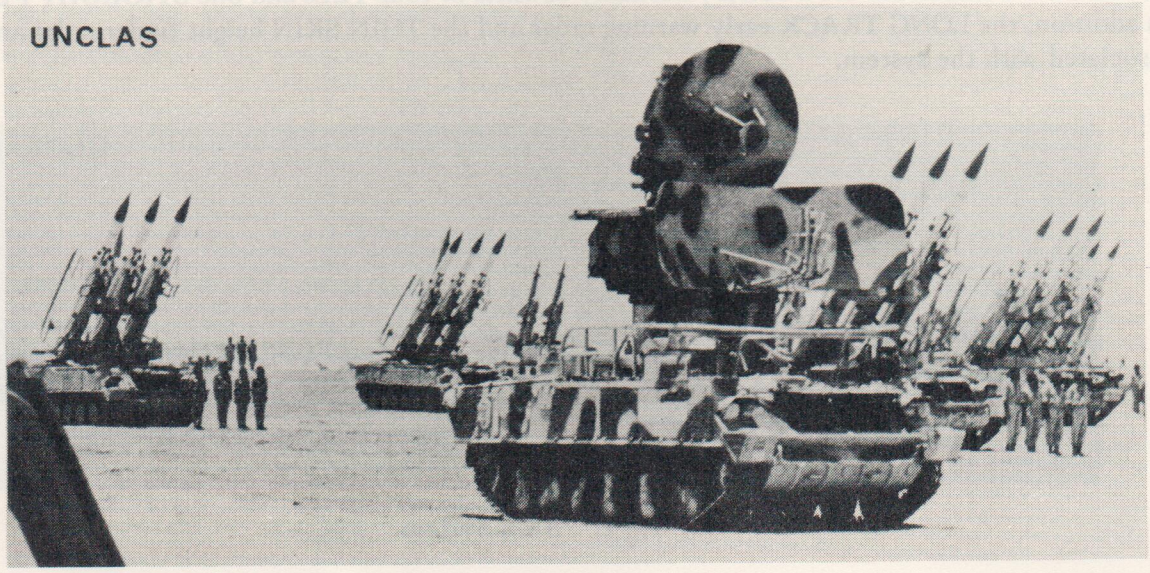

Fig 3. STRAIGHT FLUSH Fire Control Radar

STRAIGHT FLUSH

Recent open press photography of STRAIGHT FLUSH (Fig 3) in the Middle East shows that like the SA-6 TEL the chassis is based on the PT-76, and that it has both a target acquisition and target tracking capability.

System Performance

The LONG TRACK Early Warning Radar, backed by the THIN SKIN height finder Radar, normally supplies azimuth/elevation/range data to the STRAIGHT FLUSH of each battery, and allocates targets. LONG TRACK can "see" over 185 km. STRAIGHT FLUSH can "acquire" at something over 75 km. Even if denied LONG TRACK/THIN SKIN data, the system is self-contained enough to be formidable (STRAIGHT FLUSH has its own IFF).

Perhaps the most significant feature of the system's performance is that it can kill targets well below 90 m. It was claimed during the Middle East War that kills were achieved as low as 23 m.

4. Czechoslovakian 'B' Vehicles

General

After the Soviet Union, Czechoslovakia is the most prolific producer of cars and trucks in the Warsaw Pact countries, yet the models produced are not very often discussed.

The motor industry produces all the MT vehicles for the Czech Army except for the GAZ-69/69A and its replacement, the UAZ-469. Vehicles currently in service with the Czech and other Non-Soviet Warsaw Pact Forces are in the Praga and Tatra families. Recently other Non-Soviet Warsaw Pact Forces have been seen using the TATRA-148 and 813 in service and a recent COMECON decision has led to Czechoslovakia producing all the 12 tonne vehicles for the Warsaw Pact.

PRAGA

The Praga Works currently produces light vehicles AVIA-A15 on licence from Renault-Saviem of France and has for many years manufactured the Praga V3S.

PRAGA V3S (Fig 1)

Fig 1. PRAGA V35

This 6 x 6 3½-tonne truck was the principal cargo vehicle in service for many years and has been seen in other Non-Soviet Warsaw Pact countries. A photograph last year showed conclusively that even the Syrians have it. The vehicle is generally regarded as obsolescent but it can still be seen in cargo, artillery prime mover, crane and semi-trailer tractor roles.

Technical Characteristics: (PRAGA V3S)

Kerb Weight (kg)	5350
Maximum Payload (kg)	3500 (cross country)
Trailer Load (kg)	3100
Length (mm)	6910
Width (mm)	2310
Height (mm)	2920
Engine	Tatra-912 6-cylinder air cooled diesel
Performance	98 bhp @ 2100 rpm
Maximum Speed	62 km/h
Wading Capability (mm)	800

TATRA

The Tatra plant has been in production for over 70 years and has earned Czechoslovkaia a leading position in the design, development and production of heavy transport vehicles. Tatra vehicles are unique because of the lack of conventional ladder or X-type frame. The Tatra frame consists of a centrally placed large diameter tube which runs the length of the vehicle (Fig 2). This is a very effective system since it gives great resistance to torsional loads, a common experience for all cross country vehicles.

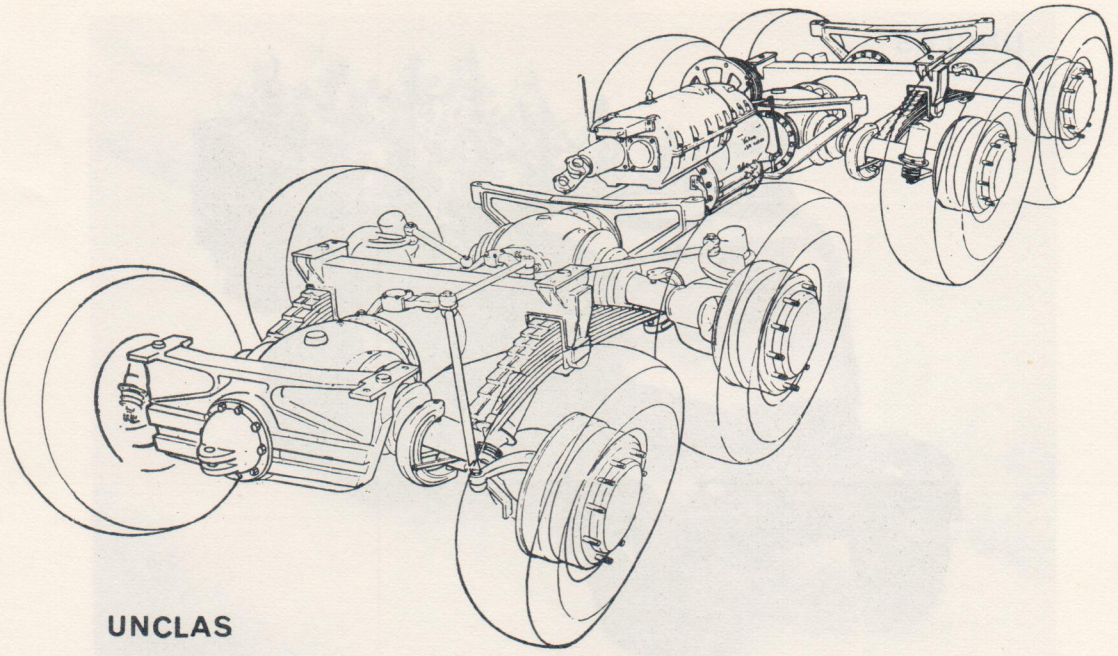

Fig 2. TATRA Central Tube Chassis

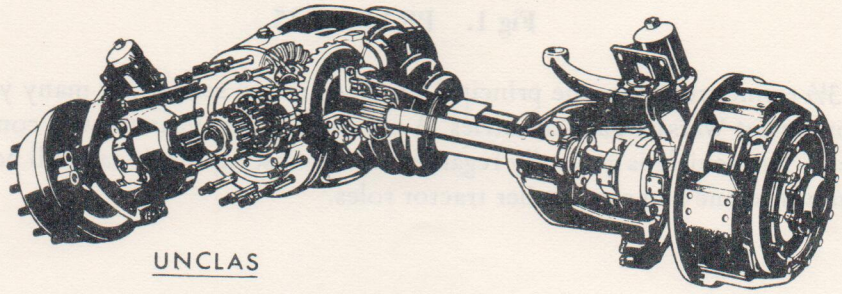

Fig 3. TATRA Half Axles Showing Positive Camber

Inside the central tube or part of it are the transmission, drive shafts and differentials. This concept allows much greater flexibility in developing a family of vehicles as can be seen below. Also, most of the power train components are standardised or inter-changeable, allowing several vehicles of different load capacities to be built, depending on the number of axles used.

Another consequence of the central tube is the half-axle suspension (Fig 3). Each axle is in fact two halves, each connected to a pinion gear on the central tube. This allows the axles to swing up and down without the need for universal joints. The axles are torsionally sprung and this makes the vehicles easy to identify when seen empty or lightly loaded. With no load, they have considerable positive camber. This is a simple method of independent suspension and gives large wheel travel, a useful feature for cross country operation.

TATRA-805

Fig 4. TATRA-805

TATRA-805 (Fig 4) This began production in 1953 as a replacement for the Praga A150 cargo vehicle. It has a high ground clearance and a commander's cupola on the cab top. It is the smallest military vehicle produced in Czechoslovakia and is used as a radio van, mobile workshop, ambulance, command post vehicle and fuel tanker. It has a 4 x 4 drive.

Technical Characteristics:

Kerb Weight (kg)	2800
Maximum Payload (kg)	1500 (cross country)
Length (mm)	4720
Width (mm)	2040
Height (mm)	2610
Engine	Tatra-603 V-8 petrol air cooled
Performance	75 bhp @ 4200 rpm
Max Speed	78 km /h
Wading Capability (mm)	650

TATRA-111

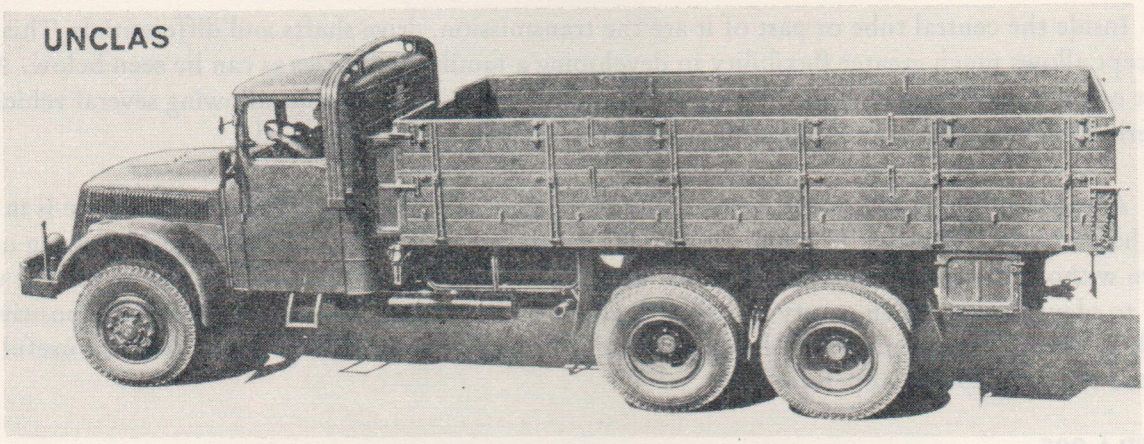

Fig 5. TATRA-111

TATRA-111 (Fig 5) Production of this 6 x 6 vehicle began in the early 1950s. It is common throughout Eastern Europe and is found in a variety of roles; cargo, tractor trucks, dump trucks and bowsers. It is being replaced by the Tatra-138 and 148.

Technical Characteristics:

Kerb Weight (kg)	8600
Maximum Payload (kg)	10240 (cross country)
Length (mm)	8300
Width (mm)	2500
Height (mm)	3050
Engine	Tatra-111A V-12 4 stroke air cooled diesel
Performance	180 bph @ 1800 rpm
Maximum Speed	62 km/h

TATRA-138

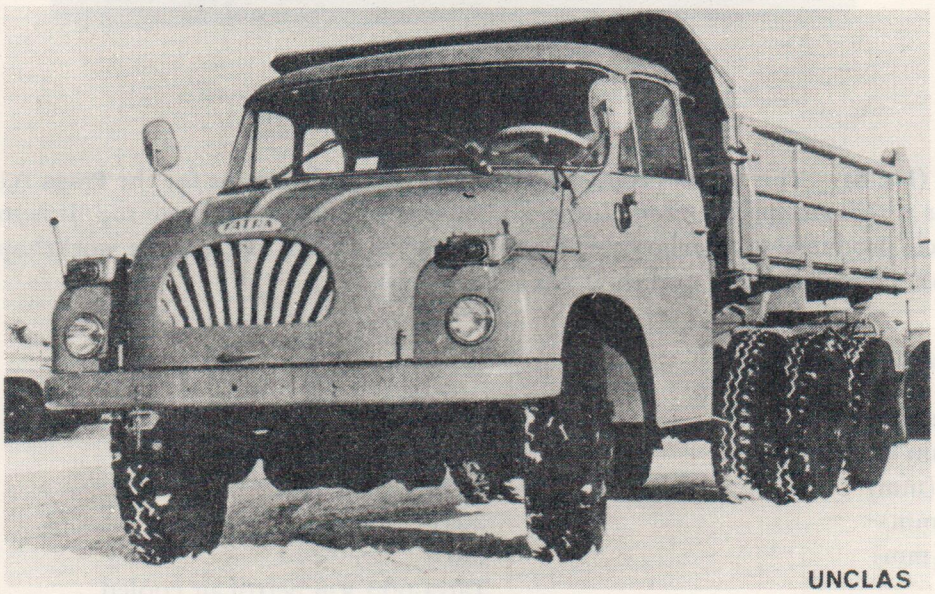

Fig 6. TATRA-138

TATRA-138 (Fig 6) This vehicle entered production in 1963 as a replacement for the Tatra-111. The engine was simplified by reducing the cylinders from 12 to 8 but the power remained the same. A variety of versions exist; cargo, fuel bowser, prime mover, crane and dump. This 6 x 6 vehicle is easily recognized by its "sun-burst" radiator grille.

TATRA-138

Technical Characteristics:

Kerb Weight (kg)	8740
Maximum Payload (kg)	8000 (cross country)
Length (mm)	8465
Width (mm)	2450
Height (mm)	3200
Engine	Tatra 928-12 V-8 4 stroke air cooled diesel
Performance	180 bhp @ 2000 rpm
Maximum Speed	72 km/h

TATRA-148

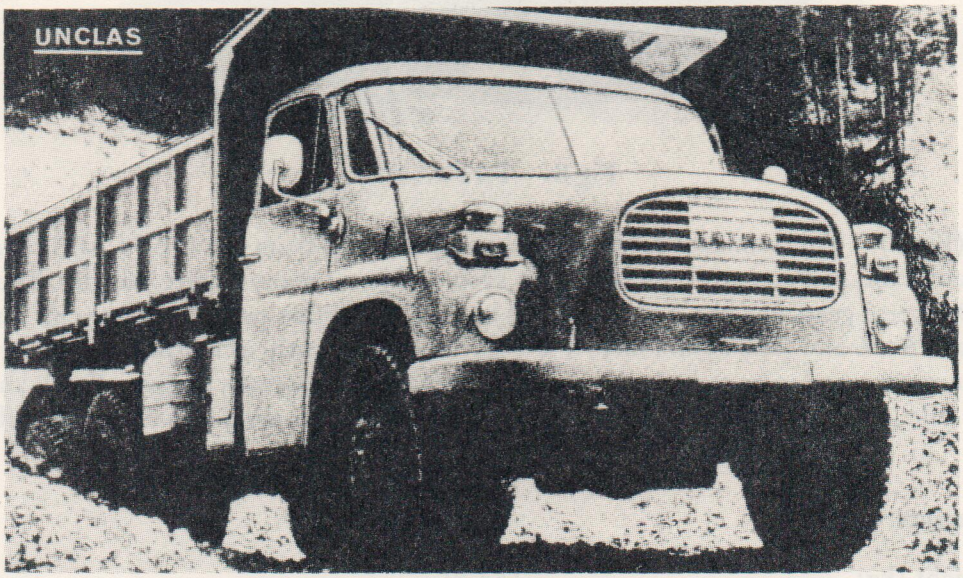

Fig 7. TATRA-148

TATRA-148 (Fig 7) The Tatra-148 series, an improvement on the 138 series, went into production in 1968. Apart from a more powerful engine, the most obvious change is the different shape of the bonnet and radiator grille. Such is the versatility of this series, there are 23 different types (4 x 4, 6 x 6, cargo, dump and prime mover varieties are permutated) but in military service, the cargo and prime move 6 x 6 types are the most common.

Technical Characteristics:

Kerb Weight (kg)	11000
Maximum Payload (kg)	8000 (cross country) 15000 (road)
Maximum towed load (kg)	37000 (road)
Length (mm)	7295
Width (mm)	2500
Height (of cab) (mm)	2750
Engine	Tatra T2-928-1 V-8 air cooled diesel
Performance	200 bhp @ 2000 rpm
Maximum Speed	71 km/h

TATRA-813

Fig 8. TATRA-813

TATRA-813 (Fig 8) This unmistakeable vehicle was developed from the OT-64 APC chassis. It has 2 steerable front axles and a central tyre inflation system, like so many Soviet vehicles. There are 20 forward and 4 reverse gears and the 7-man cab has an NBC collective protection system. The 813 appears in 8 x 8, 6 x 6 and (less commonly) 4 x 4 versions and mostly as a prime mover for artillery or tank transporters. It can also be seen in an engineer role (carrying various bridges; Figs 9 and 10) and in an artillery role (carrying a multi-barrelled rocket launcher and towing conventional artillery, Figs 11 and 12).

Technical Characteristics:

Kerb Weight (kg)	14420
Maximum Payload (kg)	12000
Towed Load (kg)	12000 (cross country)
	65000 (road)
Length (mm)	8800
Width (mm)	2500
Height (mm)	3150
Engine	Tatra 930 V-12 air cooled diesel
Performance	270 bhp @ 2000 rpm
Maximum Speed	75 km/h
Wading Capability (mm)	1400

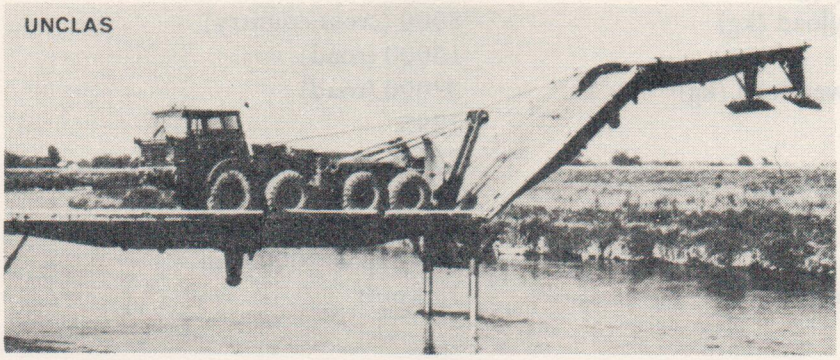

Fig 9. TATRA-813 with Scissors Bridge M-1972

TATRA-813

Fig 10. TATRA-813 8 x 8 with PMP Section

Fig 11. TATRA-813 8 x 8 MBRL

Fig 12. TATRA-813 Towing 130 mm M-46

Future

Before very long, the Praga V3S will cease production as will the Tatra-138 as the Czechs concentrate on the 148 and 813 in accordance with the COMECON directive of 1970 concerning specialisation of vehicle production. Work is currently going on developing the Tatra-815 (Fig 13) which will be a replacement for the 148 and 813 which are both to cease production in 1976. The 815 is scheduled for production in 1977. This 6 x 6 cargo vehicle will be able to carry 19 tonnes on roads and will improve the capability of the Czech MT fleet appreciably.

Fig 13. TATRA-815 6 x 6 Tipper

5. Warsaw Pact Automatic Chemical Nerve Agent Alarms

Nerve Agents

Movements of the human body are controlled by the proper operation of nerves. Nerve agents inhibit this operation and are also extremely toxic. A typical fatal dose is shown in liquid form against the point of a needle for comparison (Fig 1). Nerve agents are not always in liquid form however, and as vapour they can cause death in a few moments at concentrations so low that they cannot be detected by sight, taste or smell.

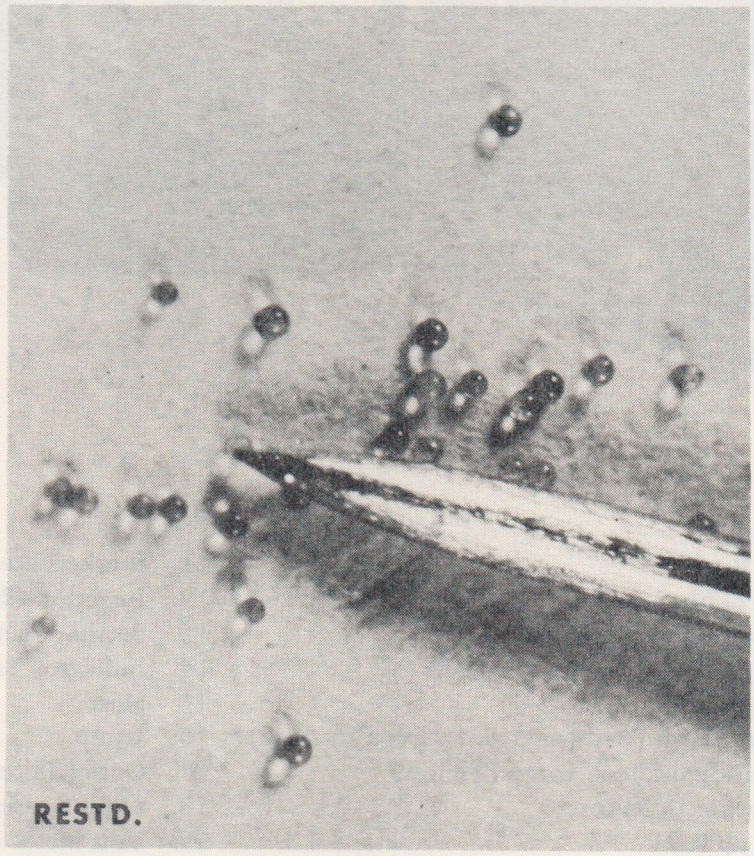

Fig 1. Fatal dose of Liquid Nerve Agent

Nerve agents may be classified as G-type or V-type. G-agents are more volatile than V-agents and present a vapour hazard. V-agents are much less volatile and can penetrate the skin to cause death.

If troops are to operate in a CW environment with any hope of survival, some form of effective warning is needed. The Warsaw Pact forces have developed a series of automatic alarms which are used in the reconnaissance units and chemical defence units and carried in -rkh vehicles (Fig 6 of AFV article).

GSP-I (Fig 2)

This earliest model was produced in 1962 and was capable of detecting only G-type nerve agents and nuclear radiation.

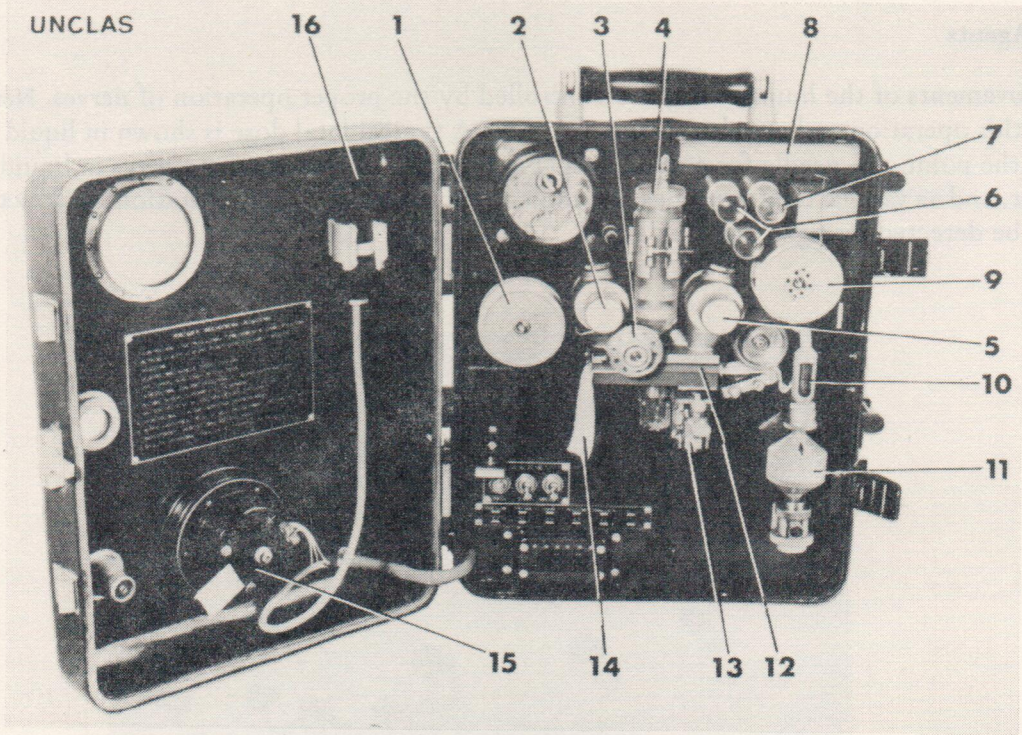

Fig 2. GSP-I

Legend

1. Tape Reel
2. Control Photocell
3. Diaphragm Adjustment
4. Dropper and Reagent Reservoir
5. Operating Photocell
6. Visual Alarm (Red for Agent, Green for Safe)
7. Operational Check Lamp (Yellow)
8. Radiation Detector
9. Take up Reel
10. Air-flow Meter (Fig 2 only)
11. Intake Filter (Fig 2 only)
12. Reaction Chamber
13. Settling Tank
14. Indicator Tape
15. Horn
16. Lamp
17. Outlet Filter (Fig 3 only)
18. Light Source (Fig 3 only)
19. Volt Meter (Fig 3 only)

In outline, the chemical detection is undertaken by placing one drop of reagent onto a paper tape through which suspect air is then drawn. If a colour change results, an alarm is sounded.

Air from outside the vehicle is drawn in by the rotary pump and filtered at the inlet (11) to remove smoke and solid particles. A drop of reagent, which has been prepared by dissolving a tablet and a liquid in a solvent, is fed from the reservoir (4) onto the tape (14) and is then moved into the small reaction chamber (12). The filtered air is passed through the moist spot for 5 minutes and finally through a second filter to remove any toxic agent present. The reagent changes colour if such agent is present. A reference beam of light is reflected from a clean piece of tape onto the control photocell (2) and also from the tape in the reaction chamber (12) to the operating photocell (5).

Differences in the electrical output from the photocells caused by a coloured spot on the tape actuate the alarms (6 and 15). Before operating, both photocells are balanced using the adjustable diaphragm (3). The tape is operated by a clockwork mechanism and the alarms by batteries, and the equipment can run automatically for 8 hours.

The GSP-I measures 45 x 30 x 15 cm, weighs about 19 kg including batteries and can operate over a temperature range of −30°C to +40°C. The halide tube radiation detector (12) actuates the alarm at radiation levels greater than 0·1 rad/h.

The main drawbacks of this detector are the lengthy (5 minutes) period needed to give a warning and the restriction of sensitivity to G-type nerve agents and nuclear radiation only.

GSP-IM (Fig 3)

This alarm is a modification of the GSP-I and is very similar in operation. There are two differences. After passing through the second filter (17) the air is released inside the cabinet, presumably to cool the interior since the lamp will raise the temperature inside the closed case considerably. The photocell system is also different. The reference beam is not reflected from a clean piece of tape but is passed through a series of filters directly to the control photocell.

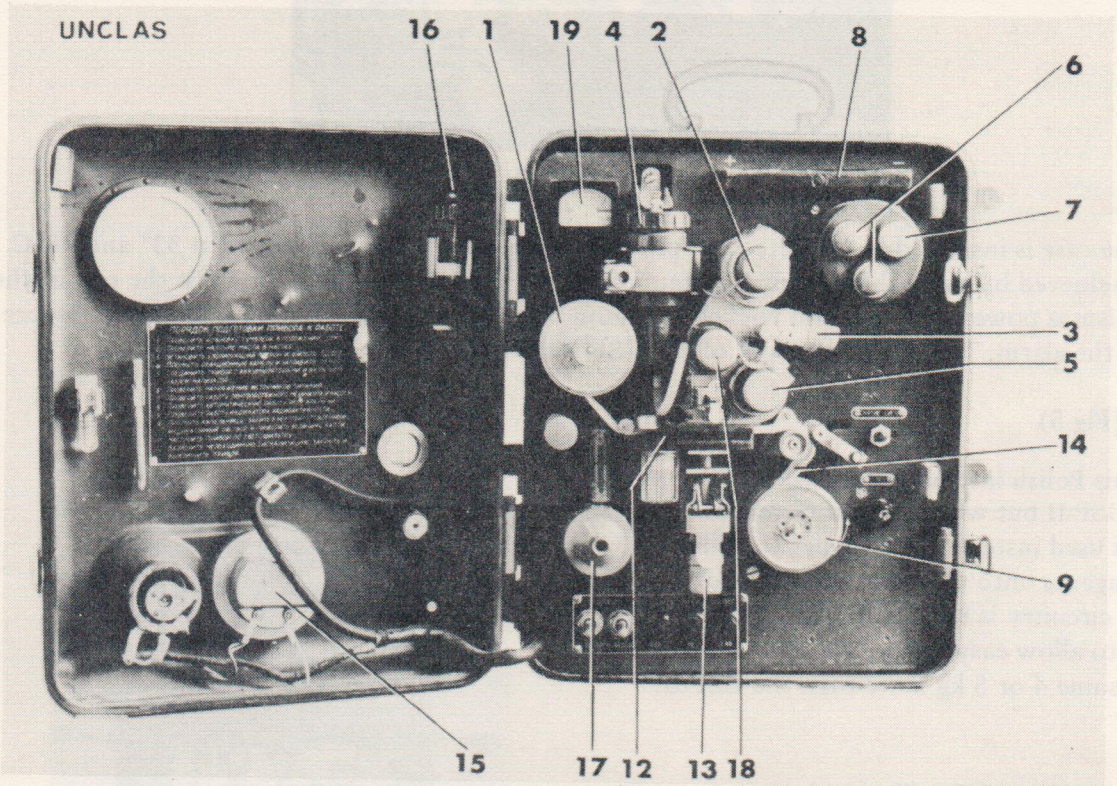

Fig 3. GSP-IM (Legend as for Fig 2)

Reports say that further modifications to the GSP-IM enable it to be used to detect hydrogen cyanide, phosgene and diphosgene. To detect these agents however, requires preparation of different reagents and this will increase the warning time considerably. The detection cycle is unchanged at 5 minutes.

GSP-II (Fig 4)

This equipment has 2 sensitivity ranges, hence its name, and can detect both G- and V-agents but not nuclear radiation. The time for the detection cycle is 20 seconds for Band I and 2½ minutes for Band II, the latter being 300 times more sensitive than GSP-I or -IM. This additional sensitivity is achieved by the use of 2 reagents which detect the inhibition of an enzyme held, as in the two previous models, on a paper tape.

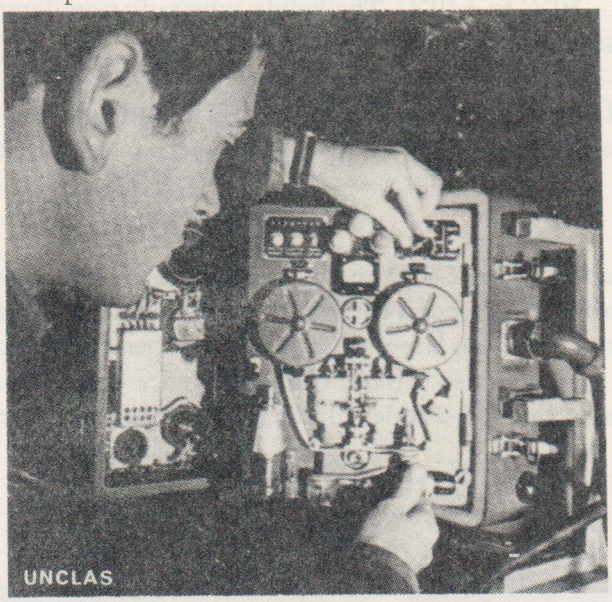

Fig 4. GSP-II

The case is insulated as the detection process requires a temperature between 33° and 38°C. This is achieved by using the electrical system of the vehicle (BRDM-rkh etc) whilst the rest of the mechanism is powered by the two Nickel Cadmium batteries provided. A colour change as before sets off the alarm. The size and weight of the GSP-II are comparable to the earlier models.

AVJ-1 (Fig 5)

This Polish instrument is basically a copy of the GSP-II but with minor differences. A pump is used instead of a dropper to deliver both reagents onto the tape, and much of the electric circuitry is built on the modular system to allow easy repair. The AVJ-1 weighs some 4 or 5 kg more than the GSP-II.

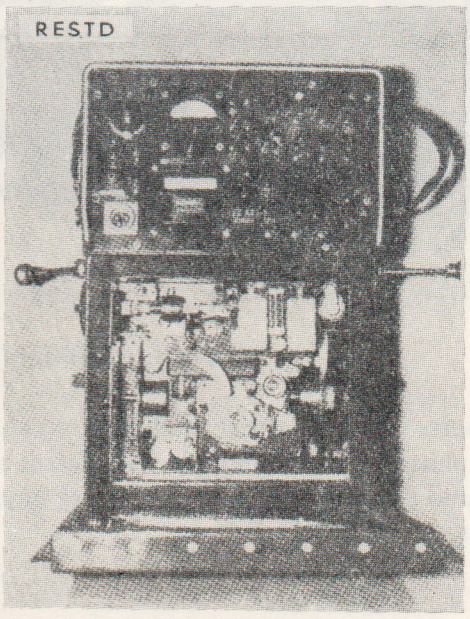

Fig 5. AVJ-1 Chemical Alarm (Polish)

6. The Soviet Army turns to Passive Night Vision

The Soviet Army has been using active night vision aids since the 1950s for driving, observation and weapon firing. The present scale of issue is immense. Active devices make use of the 'invisible light' from infra-red searchlights to illuminate the battlefield. These searchlights can of course also be seen by an enemy if he has the same sort of viewing equipment. This serious disadvantage has encouraged the development of passive devices which amplify what little light there is (and there must be some – starlight or moonlight) and so avoid detection. Over the last few years the Soviets have introduced a number of passive night vision aids of the Image Intensifier (II) type as replacements for their active equipments.

Small Arms Sights

Fig 1. NSP-2 Active IR Night Sight on Hungarian AKM

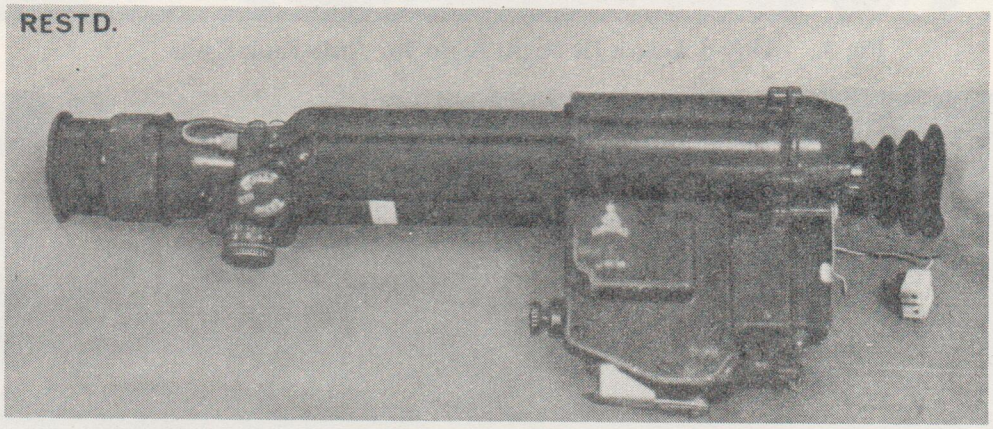

Fig 2. NSP-3 Passive (II) Night Sight for PK and AKM

Small Arms Sights (Contd)

Fig 3. PGN-1 Passive (II) Night Sight for the RPG-7 Rocket Launcher

Anti-Tank Artillery Sights

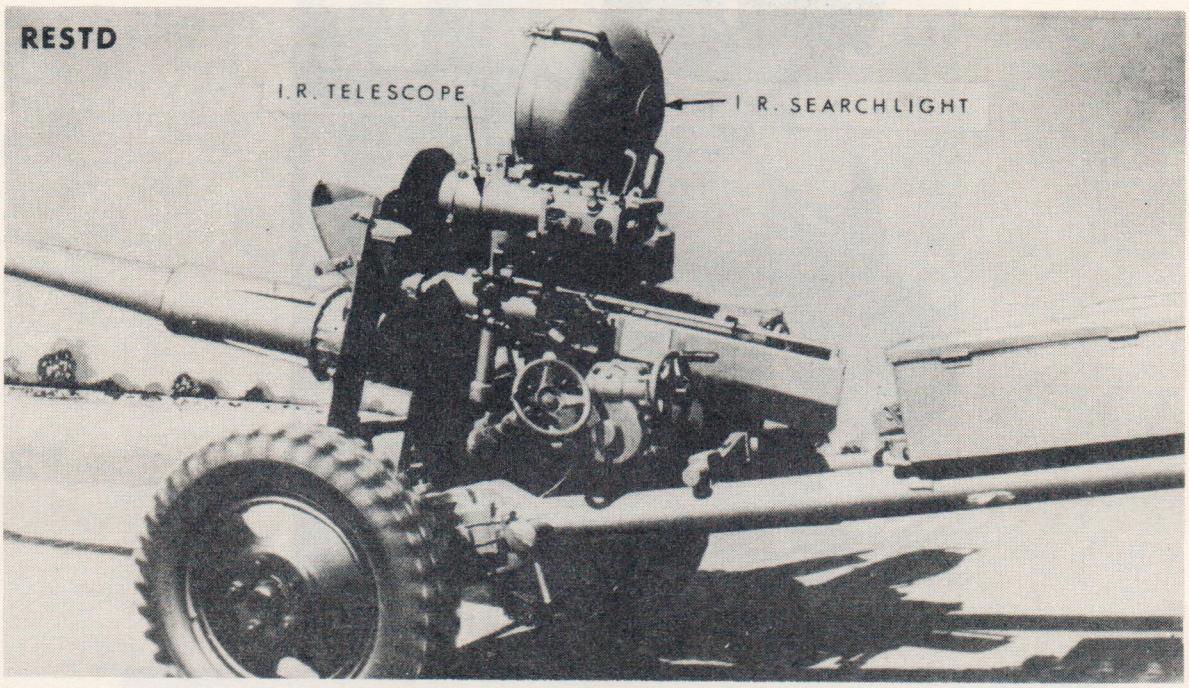

Fig 4. APN-3 Active IR Night Sight for Anti-Tank Guns

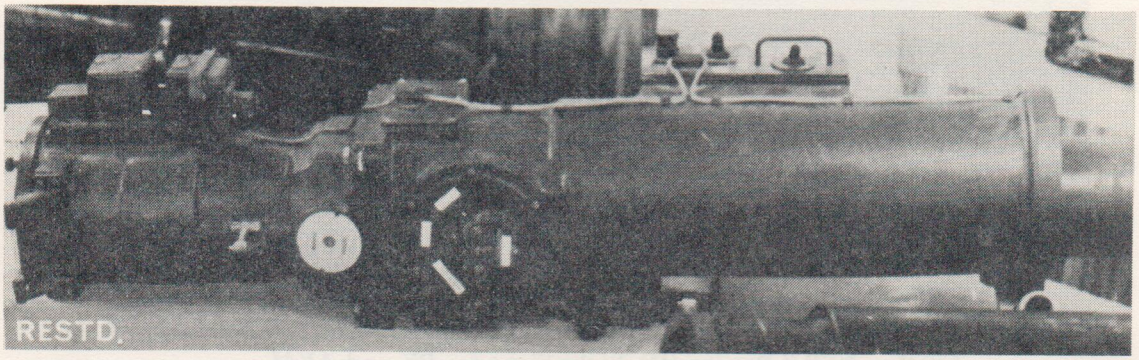

Fig 5. APN-5-40 This is actually the NNP-20M General Observation Device but it is almost identical to the APN-5-40 Passive (II) Night Sight

Driving Aids

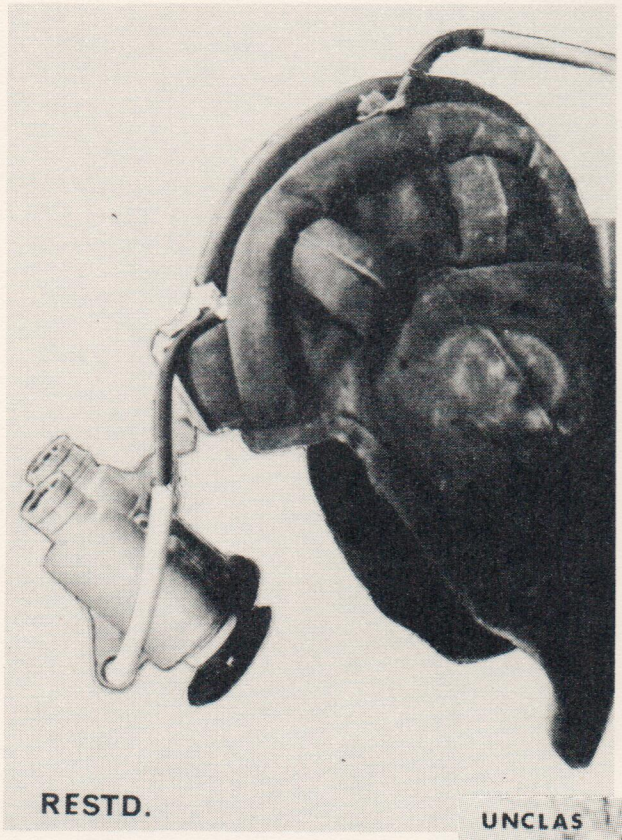

Fig 6. PNV-57
B-Vehicle Active Night Driving Aid (uses filtered vehicle headlights)

Fig 7. PPE Falcon Passive (II) Night Goggles made by Pilkington (UK) Ltd (The Soviet equipment will probably look very much like this).

All the passive sights seen so far are of the first generation type (image intensifier tubes). They are generally rugged and well-made but the picture quality is poor. It is probable therefore that better equipment is already coming into service. These will initially be improved versions of the image intensification devices probably followed by the lighter, more compact channel plate multipliers. Eventually we may well see thermal imagers being used (these 'see' the heat given off by men and vehicles and need no background illumination). However, the active IR equipments can still be useful and will probably not disappear for some years to come.

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